

Regional specificities of small business development in Russia

Региональные особенности развития малого предпринимательства в России

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Abstract

The aim of article is to research specificities of small business development across the Russian Federation regions based on the using of cluster analysis and regression models. In the first step of our study the clustering of regions according indicator of turnover on revenue per small enterprise is conducted. In the second step, the regression models on dependence the revenue turnover per small enterprise from a set of socio-economic determinants and infrastructure were constructed.

The results of the study revealed four groups of regions while the most significant factors positively affect the revenue turnover per one small enterprise are average income per capita, investments in fixed assets per capita, and the total volume of construction. Among the factors negatively affecting the revenue turnover per one small enterprise are number of organizations, conducting educational pre-schooling activity, the share of unprofitable enterprises, depreciation of fixed assets and proportion of motorway with hard surface in the overall length of highways. The results of research may be used

Аннотация

Целью статьи является исследование особенностей развития малого бизнеса в регионах Российской Федерации основанного на использовании кластерного анализа и регрессионных моделей. На первом шаге нашего исследования проводится кластеризация регионов по показателю оборота выручки на одно малое предприятие. На втором шаге были построены регрессионные модели зависимости оборота выручки на одно малое предприятие от набора социально-экономических детерминант и инфраструктуры. Результаты исследования выявили четыре группы регионов, в то время как наиболее значимыми факторами, положительно влияющими на оборот выручки в расчете на одно малое предприятие являются доходы населения, инвестиции на душу населения, общий объем строительства.

Среди факторов, негативно влияющих на выручку малых предприятий: количество организаций, ведущих образовательную дошкольную деятельность, доля убыточных предприятий, износ основных фондов.

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in the creation of regional small business development programs.

Keywords region, small business, economic development.

Результаты исследования могут быть использованы при формировании региональных программ развития малого бизнеса.

Ключевые слова: регион, малый бизнес, экономическое развитие

Introduction

Small business plays vital role in market economy representing a set of flexible enterprises that are able to operate in tough conditions adapting to new challenges. Current development of small business enterprises across Russian regions demonstrates mixed picture due to existing local identities and regional disparities regarding financial, labor and other resources. Recent-years statistics witnessed the financial meltdown and reduced number of these economic units whereas among main reasons should be labelled decrease in customer demand, increased fiscal burden and sanction pressure. Therefore to propose decisions adequate to observed realities policy-makers at different scales need to assess the key drivers' influence on small entrepreneurship.

At present, the state is taking tangible steps to establish groundwork for further small business development. The strategic targets include: improving the legislation of the Russian Federation (including the new tax regime for the self-employed), the transformation of the business climate; consulting, educational, property support for entrepreneurs through single entry points, development of a support system for export-oriented companies, development of a franchising system and development of small business enterprise in order to accelerate their activities in single-industry towns. But all proposed initiatives take place on specific territory thus regional aspects of operating small business should be taken into account. Regional environment imposes inherit peculiar conditions and background within which small business is expected to adapt and going thrive. Industrial structure, economic position of the region, its geographical location in some extent predetermine success of small business.

The paper target is twofold. Firstly, our research addresses classifying of Russian regions according turnover of revenue per enterprise that would provide a picture of regionally organized patterns. In addition regression OLS models will be constructed to assess impacts of economic, social and infrastructure variables on clustering criterion. Thus we will provide deep understanding what factors are becoming increasingly important in the less and more economically developed regions within national space. The rest of article is organized as follows. Section 1 presents literary review on science behind on factors that affect performance outcomes of small business. Section 2 (methodology) reveals the methods of research, among them are clustering and regression models. Section 3 (Results) highlights main findings. Conclusion (Section 4) includes final remarks.

Literature review

Matters on key drivers of building up favorable business environment and as a consequence increasing number of small entrepreneurship are in focus of vast bulk studies both in empirical and theoretical lines. There is huge research area that contains different trains of thoughts and related conceptual frameworks. Müller S. (2016) provides in-depth literature review on regional entrepreneurship which based on 170 peer-reviewed articles. The author finds out that 76% percent of reviewed papers are empirical; econometric methods including time-lag structures are particularly popular whereas most of examined studies deal with the regional scale.

Yaluner E., Levitina I., Vetrenko P. etc. (2018) analyze the institutions of support for entrepreneurship within next classification criteria: organizational/legal status, founders, type of activity. They propose to assess the level of development of infrastructure by involving general coefficient for the availability of infrastructure for the entrepreneur's support and apply it to St. Petersburg and Leningrad region case. Authors define high, medium, sufficient, and low levels of infrastructural development.

Güven S., Kaymaz T., Kadkoy O. (2018) consider effects of refugee entrepreneurship through a number of factors that push refugees to self-employment. Among they are: diaspora networks, family support and previous experience in entrepreneurship.

Devece C. et al. (2016) explore if economic growth has influence on entrepreneurial activity and what entrepreneurial intentions are during economic crisis took place in 2008. The authors try to find out what reasons push people up to self-employment and define «necessity entrepreneurship» that can be explained as coerced entrepreneurship in which people are engaged because of lack fitting job.

In the study conducted by Doran, J., McCarthy, N., O'Connor M. (2016) the research question is if the positive relationship between entrepreneurship and regional employment growth holds across various European regions. They analyze the impact of firm births on employment growth at regional level.

Hu, M., Su, Y., & Ye, W. (2019) investigate whether rising housing prices have any effects on entrepreneurial activities in China with regard to mechanisms affecting entrepreneurship among which are labor market opportunities, relaxation of credit constraints, and housing market opportunities. Their results indicate that housing price has a positive and diminishing effect on labor market opportunities while it relieves the negative effect of high prices on the entrepreneurial engagement of home owners (relaxation of credit constraints).

Prieger, J. E. (2016) et al. examine deviations of country's entrepreneurship from its optimal level that is labelled as growth penalty and its influence on economic growth. They revealed that developing countries remain poor notwithstanding the high level of small business whereas the optimal rate of entrepreneurship is higher in lower income countries. Detailed aspects of functioning small business enterprises are highlighted by Cataldo A. et al (2019), Schaefer A. et al (2020), Donald DC. (2020), Edvardsson I. et al (2020).

Russian scientists also added insightful studies to extensive literature body on operating small business in conditions of transition economy (Amirova E.F. etc. (2019), Litvinenko I.L. (2018), Kosnikov S.N. et al (2017), Nikitina A.S. et al (2019), Bunkovskiy D.V. (2016), Khamkhoeva F.Ya. (2018)). For instance, Yusupov, K., Grishin, K., Timiryanova, V., & Krasnoselskaya, D. (2019) explore the variance of the profitable firms in 330 municipalities within 7 constituent entities of the Russian Federation. Their research results show that region defined up to 25.2% of the variance in the share profitable enterprises in municipalities.

Suvaryan, A. M., Mkrtichyan, N. G. & Manukyan, H. Kh. (2018) argue necessity of creating intermediary organizations for involving small business into export-oriented transactions in regions as it has been applied in Armenia. Authors suggest unique technique that makes possible the efficiency assessment of operational activity these institutions via comparing export costs. Khamzina D.R. et al (2019) consider the complex model accounting and analytical support of calculations with counterparties in small business. Proposed model consists of interlinked blocks of accounting, internal control and analysis aimed on improvement financial support for decision-making. Thus, we deep existing vast body of literature by firstly clustering Russian regions according turnover of revenue per enterprise and exposing the triggers for each clustering criteria.

Methodology

On the first step the data for 2018 was collected from the official website Rosstat that provides statistic information relating to regional development and small business in Russia. Cluster analysis targets on setting out homogenous groups of cases within examined data. We applied average linkage between groups method and Euclidean distance square (equation 1) while conducting clustering analysis. Average linkage between groups method assumes that distance between clusters equals average values of distances on all theoretically possible arbitrary pairs of points from both clusters. In our study the turnover of revenue per small enterprise (TURN) was engaged to partition territorial units into clusters.

$$d(X, Y) = \sum_{i=1}^m (X_i - Y_i)^2 \quad (1),$$

where $d(X, Y)$ - Euclidean distance square, m – the number of objects.

On the second step we analyze relationships between turnover of revenue per enterprise (TURN) and variables related to social – economic and infrastructure indicators in regions, using the next multiple regression (equation 2):

$$TURN = a_0 + a_1 empl + a_2 conv + a_3 scien + a_4 doct + a_5 migr + a_6 unpro + a_7 depr + a_8 chil + a_9 inc + a_{10} inv + a_{11} road + a_{12} himp + a_{13} hsqu \quad (2),$$

The labels of variables are disclosed in the table 1.

Table 1.
Labels of variables (regional scale)

Variable	label
doct	Number of doctors per 10,000 people
migr	Growth migration ratio, per 10,000 people
chil	Number of organizations, conducting educational activities relating to pre-schooling per 10,000 people
inc	Average income per capita, in roubles
himp	Residential housing construction per 10,000 people, square meters
hsqu	The total average area of living space, per inhabitant
depr	Depreciation of fixed assets, %
empl	Average number of employees per small enterprise
inv	Investments in fixed assets per capita, roubles
unprof	The share of unprofitable enterprises, %
conv	Overall building volume, thousand m ³ per 1000 people
road	The proportion of motorway with hard surface in the overall length of highways, percent
scien	Number of organizations, conducting research and development per 10,000 people

Source: own elaboration

Average number of employees per small enterprise and investments in fixed assets per capita are regarded to have positive impact on turnover of revenue per small enterprise; it is induced from neoclassical production function. We expected the negative relationships between turnover of revenue per enterprise and the number of organizations conducting pre-schooling activities because of next reason. As a rule, small enterprises do not give social package to young women who have pre-school children thus latter avoid entering for a job in to small enterprise that means outflow of the labour force.

The influence of road infrastructure and number of organizations, conducting research and development are not easily predictable. Road infrastructure is considered within regions, but the operational scale of small business is much narrower whereas organizations, conducting research and development are separated from small business practices; it leads to absence of joined research and development programmes.

Results and discussion

Given traditional spatial heterogeneity it seems reasonable to explore descriptive statistics of examined variables (table 2).

Table 2.
Descriptive statistics of variables (regional scale)

Category	Variable	label	Min	Max	Mean	Standard deviation
Social development	<i>doct</i>	Number of doctors per 10,000 people	29,80	80,70	47,56	9,73

Table 2.
 Descriptive statistics of variables (regional scale)

Category	Variable	label	Min	Max	Mean	Standard deviation
Economical development	<i>migr</i>	Growth migration ratio, per 10,000 people	-132,00	202,00	-6,37	57,03
	<i>chil</i>	Number of organizations, conducting educational activities relating to pre-schooling per 10,000 people	0,54	8,40	3,93	1,39
	<i>inc</i>	Average income per capita, in roubles	15011,00	73019,00	28180,96	9946,35
	<i>himp</i>	Residential housing construction per 10,000 people, square meters	44	1456	493,35	244,60
	<i>hsqu</i>	The total average area of living space, per inhabitant	14	32	26	3,600
	<i>depr</i>	Depreciation of fixed assets, %	36,00	68,50	48,86	7,78
	<i>empl</i>	Average number of employees per small enterprise	2	7	4	0,97
	<i>inv</i>	Investments in fixed assets per capita, roubles	26354,00	612704,00	98067,340	86527,120
	<i>road</i>	The share of unprofitable enterprises, %	14,500	50,600	33,380	6,680
	<i>road</i>	Overall building volume, thousand m3 per 1000 people	758	12019,894	3794,347	2205,889
Infrastructure and science	<i>road</i>	The proportion of motorway with hard surface in the overall length of highways, percent	39,300	99,800	71,640	14,250
	<i>scien</i>	Number of organizations, conducting research and development per 10,000 people	0,070	0,710	0,250	1,120

Source: own elaboration

As Table 2 shows there is significant regional heterogeneity in terms of growth migration ratio, residential housing construction, average income per capita, investments in fixed assets per capita, share of unprofitable enterprises and overall building volume that reflect local place identities and results of the latest reforms encouraged to alleviate astronomical social-economic differentiations.

Due to gaps in social infrastructure and income of population throughout the country people tend to change settlement and employment patterns while growth migration ratio is varying from -132 to 202. With increasing disparities in investments in fixed assets this creates conditions and prerequisites for removal of labor and investments resources from hinterland to huge centers like Moscow and St.Peterburg. Speaking about peculiarities of operating small business, it worth saying on share of unprofitable enterprises that at maximum rate is 50.6 %. It is known that most of new created firms liquidate during the first year. But in established business environment full of profitable enterprises the new firm has more chances to survive through the economizing on transaction costs, well-developed infrastructure and supplier networks being used together with the other enterprises. However, high average rates incomes per capita are leading to increase in purchasing power. Thus, in our opinion, average income per capita, is positively associated with turnover of revenue per small enterprise.

The number of doctors is relatively homogeneous indicating the fulfilment of basic state's social guarantees across the regions. Overall building volume is regarded to be positively linked with turnover of revenue per small enterprise as this branch of national economy enable to multiply economic impulses across others ones.

Having conducted cluster analysis using method of average linkage between groups we obtained four clusters presented in the table 3. Among groups the second and the third ones are most numerous, at the same time the fourth group includes the only one region that makes impossible regression analysis within this group.

The first group represents economically developed leading regions of Central Federal District and Southern Federal District in which values of all regression model factors exceed average values within Russia. Central Federal District the most inhabited part of the country, it occupies 4% of total state's area and holds 25% of overall population. This cluster has the highest rates of income per capita (table 4) that can be explained a variety sub-offices of foreign companies operating in this territory, well-developed infrastructure and industries focusing on export. There are a lot of academic establishments and science organizations scattered throughout the area under consideration that adds to its dominant position.

Table 3.
Regions' clustering results

Number of cluster	Regions in the cluster
1	Belgorod region, Voronezh region, Kursk region, Lipetsk region, Tambov Region, Moscow city, Krasnodar Krai, Rostov region, Primorsky territory, Magadan Region, Chukotka Autonomous Okrug
2	Bryansk region, Vladimir region, Ivanovo region, Kaluga region, Kostroma region, Moscow region, Oryol Region, Ryazan Oblast, Smolensk region, Tver region, Tula region, Komi Republic, Arkhangelsk region, Kaliningrad region, Leningrad region, Murmansk region, Pskov region, St. Petersburg, Adygea Republic, Karachay-Cherkess Republic, Bashkortostan Republic, Mari El Republic, Tatarstan Republic, Udmurt republic, Perm region, Kirov region, Orenburg region, Samara Region, Saratov region, Ulyanovsk region, Sverdlovsk region, Tyumen region, Chelyabinsk region, Altai region, Krasnoyarsk region, Irkutsk region, Kemerovo region, Novosibirsk region, Sakha (Yakutia) Republic, Khabarovsk region, Amurskaya Oblast, Sakhalin Oblast, Jewish Autonomous Region, Volgograd region, Kamchatka territory
3	Yaroslavskaya oblast, Karelia Republic, Vologda Region, Novgorod region, Kalmykia Republic, Crimea Republic, Astrakhan region, Sevastopol, Ingushetia Republic, Kabardino-Balkarian Republic, North Ossetia – Alania Republic, Chuvash Republic, Altai Republic, Buryatia Republic, Tyva Republic, Khakassia Republic,
4	Transbaikalia region, Omsk region, Tomsk region, Kurgan region
	Dagestan Republic

Source: own elaboration

The second cluster contains sustainable in economic development regions upon which the most indicators are higher than average values across the Russia. The key industries are oil production, production and distribution of electrical energy, ferrous and non-ferrous metallurgy, mechanical engineering. The structure of the second cluster is rather mixed. There we observe the depression regions (Altai region, Mari El Republic) to be supported by government in 2020.

Table 4.
Average values of examined characteristics across regions

	Cluster 1	Cluster 2	Cluster 3	The average for Russia
doct	49,564	46,647	48,910	47,56
migr	-4,982	-1,878	-15,450	-6,37
chil	3,787	3,813	4,357	3,93
inc	38883,455	28107,044	22545,800	28180,96
himp	532,091	516,822	411,150	493,35
hsqu	26,882	26,393	23,455	26
depr	45,645	49,358	49,485	48,86
empl	4,811	4,549	3,784	4
inv	133028,455	105315,067	64169,200	98067,34
unprof	32,627	33,151	34,830	33,38
conv	4472,275	4133,380	2684,327635	3794,347
road	75,073	71,884	69,040	71,64
scien	0,305	0,241	0,248	0,25

Source: own elaboration

On the second step, we conduct exploratory regression analysis to assess impacts of social-economic determinants of turnover of revenue per small enterprise (table 5). The regressions' findings are calculated for the first, second and third clusters because of number of observations.

Table 5.
Regression results (regions)

Predictors	Cluster 1	Cluster 2	Cluster 3
Standardized Beta Coefficients			
doct	* ²³⁰	-0.032	0.003
migr	*	*	0.047
chil	-0.520	-0.136	-0.94
inc	0.671	0.190	1.168
himp	*	-0.005	0.870
hsqu	*	0.084	-0.424
depr	*	*	*
empl	-0.328	0.084	1.251
inv	*	*	0.067
unprof	*	-0.024	-0.789
conv	*	0.109	0.019
depr	-0.005	-0.155	-0.040
road	-0.158	-0.105	*
scien	*	*	-0.202
R ²	0.841	0.147	0.932
Standard error of regression	0.950	1.890	0.670
F-test	5.28	0.584	6.34
Darbin-Watson statistic	1.321	2.199	1.732

Source: own elaboration

²³⁰ Excluded due to collinearity or not significant at the 5% significance.

The third cluster is characterized by economically disadvantaged areas with high rate of unemployment, the lowest incomes rate and the highest growth migration ratio reflecting unfavorable conditions of people's life-being. As a rule these territories are historically rooted industrial regions which are unable to adapt to market challenges after fall of Soviet Union thus there are many single-industry town causing social unrest and unemployment. The Republic of Dagestan turned out to be the only region in the fourth cluster.

Table 4 demonstrates good fittings of regression models attributed to the first and third clusters whereas the chosen predictors for regions in the second cluster are unable to account much of dependent variable variation. The results revealed positive relationships between turnover of revenue per small enterprise and investments in fixed assets per capita, overall building volume, average income per capita; these estimations were expected due to stated above assumptions concerning production function and basic macroeconomic equivalence which consider households to spend money for increasing economic growth. The Republic of Sakha (Yakutia) and Sakhalin Oblast are investment leaders having abundant natural resources, well-developed infrastructure, system of tax breaks and fiscal incentives aimed on diversification of oil and gas industries. Ivanovo region, Kostroma region, Tyva Republic, Ingushetia Republic are outsiders, the values of investments per capita are varying from 26595 to 31967 roubles respectively. Chukotka Autonomous Okrug is confidently leading on the rate of average income per capita; it linked with legally established doubling social payments and wages in severe environmental conditions.

However, number of organizations, conducting educational pre-schooling activities, the share of unprofitable enterprises, depreciation of fixed assets and proportion of motorway with hard surface in the overall length of highways are negatively associated with turnover of revenue per small enterprise. The equipment depreciation reflecting negative context is crucial question of innovation-driven path that is special trigger for small business because of its flexibility and adaptability under changing circumstances. The highest depreciation of fixed assets ratios are observed in the Republic of Crimea and depressed regions of Mari El and Udmurt Republic where there is a dominance of the agriculture and defense industry sectors accompanied by natural resource constraints. Discussing the share of unprofitable enterprises we observed uneven picture. Dagestan Republic, being under unfavorable economic climate, has the lowest share of unprofitable enterprises and the highest turnover of revenue per small enterprise.

In addition, Moscow and St. Petersburg are characterized by the greatest indicators of the proportion of motorway with hard surface that stems from their geographical position and functions of huge economic centers. However, across the other regions we should highlight Sevastopol being engaged into large-scale national infrastructure projects.

Conclusion

Our research question was twofold – clustering small enterprise within Russian regions and identification key determinants that influence turnover of revenue per enterprise. Our findings have shown regional asymmetry in terms of growth migration ratio, residential housing construction, average income per capita, investments in fixed assets per capita, share of unprofitable enterprises and overall building volume. After having clustered regions we obtained four clusters. The first cluster included leading regions primarily located in Central Federal District and Southern Federal District where high households' purchasing power, export-oriented industries, well-developed social and transport infrastructure took place. The second cluster covers regions with relatively sustained dynamics of growth, healthy manufacturing sector and indicators of quality of people's lives that are closing to average rates across Russia. The third cluster consists of the least developed regions being suffered by ineffective industrial specialization that led to low households' income, worsening social well-being and poor infrastructure.

With focusing on factors that influence the turnover of revenue per enterprise we chose a set of determinants attributed to economic, social and infrastructure development. Our findings showed turnover of revenue per small enterprise to be positively correlated with investments in fixed assets per capita, overall building volume and average income per capita. In contrast, numbers of organizations, conducting educational pre-schooling activities, the share of unprofitable enterprises, depreciation of fixed assets and proportion of motorway with hard surface in the overall length of highways have negative impact on examined indicator. Gained results might be used in regional initiatives, governmental programs aimed on creating a business climate friendly to investments and entrepreneurship in whole.

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